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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/931,469	08/16/2001	Rajiv Laroia	Flarion-21	2998
26479	7590	09/06/2005	EXAMINER	
STRAUB & POKOTYLO 620 TINTON AVENUE BLDG. B, 2ND FLOOR TINTON FALLS, NJ 07724			NGUYEN, STEVEN H D	
			ART UNIT	PAPER NUMBER
			2665	

DATE MAILED: 09/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/931,469

Applicant(s)

LAROIA ET AL.

Examiner

Steven HD Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>7/02; 2/05</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 20, 22 and 24 rejected under 35 U.S.C. 102(e) as being anticipated by Reusens (USP 6240129).

Regarding claims 20 and 22. Reusens discloses a method of processing a received orthogonal frequency division multiplexed signal to generate symbol values, the method comprising; performing a channel equalization operation on the received OFDM signal in the time domain (Fig 1, Ref TEQ); and mapping values of the OFDM signal after channel equalization at instants in time used to transmit symbol values to symbol values (Fig 1, Ref Demap).

Regarding claim 24, Reusens discloses a communications system comprising an orthogonal frequency division multiplexed signal transmitter (Fig 1, Ref T) including a symbol to time instant mapping module (Fig 1, Ref MAP) for mapping a plurality of symbols to be transmitted to uniformly spaced points in time within a time period corresponding to a symbol duration; and an orthogonal frequency division multiplexed signal receiver (Fig 1, Ref R) including: a time instant to symbol mapping module (Fig 1, Ref Demap) for mapping signal values at points in time used to transmit symbols to symbol values.

*Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject-matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blanchard (USP 5612978) in view of Wang (USP 5822368).

Regarding claims 1-2, Blanchard discloses a method of processing a frequency division multiplexed signal representing a plurality of symbols and including a plurality of tones, a first subset of said plurality of tones being allocated to a first user, the method comprising the steps of: performing a time domain (Fig 1, Ref 16) to frequency domain transform operation on the frequency division multiplexed signal to generate a frequency domain signal there from; filtering the frequency domain signal to remove tones in said plurality of tones which are not included in said first subset of tones (Fig 1, Refs 17-18 and 22); performing a frequency domain to time domain transform operation on the filtered frequency domain signal to generate a filtered time domain signal (Fig 1, Ref 22). However, Blanchard fails to disclose recovering symbols transmitted to the first user from the filtered time domain signal. In the same field of endeavor, Wang discloses a method for recovering symbols transmitted to the first user from the filtered time domain signal (Fig 5, Ref 525, 540, 565 535, 570, 575, 580 and 705 used to recover the transmitted symbols); wherein recovering symbols includes performing a channel equalization operation on the filtered time domain signal (Fig 5, Ref 570).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to apply a method and system for recovering the transmitted signal as disclosed by Wang into the system and method of Blanchard. The motivation would have been to obtain a quality signal.

Regarding claims 3-9, Blanchard and Wang fails to disclose recovering symbols further includes performing a channel estimation operation, said channel estimation operation including: identifying a training symbol in the filtered time domain signal; and generating at least one channel estimation as a function of the difference between the identified training symbol and a known training symbol value and Wang discloses each dwell includes training symbols which is located in the middle of dwell and performing equalization without midamble (Col. 18, lines 38-58). However, the examiner takes an official notice that a method and system for estimating channel characteristic based on the difference between known and identified training symbol is well known and expected in the art at the time of invention was made in order to implement this method into the teaching of Wang and Blanchard because Wang suggests a known training signal for using in the channel estimating. The motivation would have been to provide a quality signal.

5. Claims 10-13 rejected under 35 U.S.C. 103(a) as being unpatentable over Blanchard and Wang as applied to claim 1 above, and further in view of Vijayan (USP 6717908).

Regarding claims 10 and 13, Blanchard and Wang fails to disclose the frequency division multiplexed signal is an orthogonal frequency division multiplexed signal; and wherein recovering symbols transmitted to the first user includes: mapping values of the filtered time domain signal at instants in time used to transmit symbol values to values in a set of symbol

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values. In the same field of endeavor, Vijayan discloses a time instant to symbol mapping module coupled to the frequency to time domain transform module for mapping signal values at points in time to symbol values (Fig 3, Ref 46, soft decision quantizer and Fig 4, col. 7, line 37 to col. 8, line 5) and receiving the frequency division multiplexed signal from a communications channel including frequency division multiplexed signals corresponding to users other than the first user (Fig 1).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to apply a method and system for demapping the transmitted signal into original signal as disclosed by Vijayan into the system and method of Blanchard and Wang. The motivation would have been to obtain a quality signal.

Regarding claim 11, Blanchard and Wang fails to disclose recovering symbols transmitted to the first user further includes performing a symbol value to symbol value mapping operation to map symbol values generated by mapping values of the filtered time domain signal to values in another set of symbol values. However, the examiner takes an official notices that a method and system for performing a symbol value to symbol value mapping operation to map symbol values generated by mapping values of the filtered time domain signal to values in another set of symbol values symbol is well known and expected in the art at the time of invention was made in order to implement this method into the teaching of Wang, Vijayan and Blanchard. The motivation would have been to obtain a quality level by performing mapping between modulated symbol levels with symbol values.

Regarding claim 12, Blanchard discloses performing a time domain to frequency domain transform operation includes performing one of a Fast Fourier Transform operation and a

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Discrete Fourier Transform operation; and wherein performing a frequency domain to time domain transform operation includes performing one of an Inverse Fast Fourier Transform operation and an Inverse Discrete Cosine Transform operation (Fig 1).

6. Claims 14 and 19 rejected under 35 U.S.C. 103(a) as being unpatentable over Blanchard in view of Vijayan (USP 6717908).

Regarding claims 14 and 19, Blanchard discloses an apparatus for processing a frequency division multiplexed signal representing a plurality of symbols and including a plurality tones, a first subset of said plurality of tones being allocated to a first user, the apparatus comprising a time to frequency domain transform module (Fig 1, Ref 16) for generating a frequency domain signal from the frequency division multiplexed signal; a tone filter (Fig 1, Refs 17-18 and 22) for filtering from the frequency domain signal generated by the time domain to frequency domain transform module tones other than those included in the first subset to thereby generate a filtered frequency domain signal; a frequency to time domain transform module (Fig 1, Ref 22) for performing a frequency domain to time domain transform operation on the filtered frequency domain signal to thereby generate a time domain signal; wherein the time to frequency domain transform module is a Fast Fourier Transform circuit; and wherein the frequency to time domain transform module is an inverse Fast Fourier Transform circuit (Fig 1). However, Blanchard fails to disclose a time instant to symbol mapping module coupled to the frequency to time domain transform module for mapping signal values at points in time to symbol values. In the same field of endeavor, Vijayan discloses a time instant to symbol mapping module coupled to the frequency to time domain transform module for mapping signal

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values at points in time to symbol values (Fig 3, Ref 46, soft decision quantizer and Fig 4, col. 7, line 37 to col. 8, line 5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to apply a method and system for demapping the transmitted signal into original signal as disclosed by Vijayan into the system and method of Blanchard. The motivation would have been to obtain a quality signal.

7. Claims 15-18 rejected under 35 U.S.C. 103(a) as being unpatentable over Blanchard and Vijayan as applied to claim 14 above, and further in view of Wang (USP 5822368).

Regarding claims 15-16, Blanchard and Vijayan fails to disclose a channel equalization module coupling said frequency to time domain transform module to the time instant to symbol mapping module, the channel equalization module performing channel equalization operations on said time domain signal by using information from channel estimating but Vijayan discloses a complex equalizer to be used for OFDM system. However, Wang discloses a channel estimation circuit (Fig 5, Ref 525, 540, 565 and 535) coupled to said frequency to time domain transform module and to the channel equalization module for generating at least one channel estimate from the time domain signal and for supplying the channel estimate to the channel equalization module for equalizing the filtered time domain signal (Fig 5, Ref 570).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to apply a method and system for recovering the transmitted signal by performing a channel equalizer as disclosed by Wang into the system and method of Blanchard and Vijayan. The motivation would have been to obtain a quality signal

Regarding claim 17, Blanchard and Vijayan fail to disclose a symbol-to-symbol mapping module coupled to the time instant to symbol mapping module. However, the examiner takes an official notice that a method and system for performing a symbol value to symbol value mapping operation is well known and expected in the art at the time of invention was made in order to implement this method into the teaching of Wang, Vijayan and Blanchard. The motivation would have been to obtain a quality signal by performing mapping between modulated symbol levels with symbol values.

Regarding claim 18, Vijayan discloses a cyclic prefix discarding circuit coupled to the time to frequency domain transform module for discarding portions of the frequency division multiplexed signal corresponding to cyclic prefixes (Fig 3, ref 40).

8. Claims 21, 23 and 25-26 rejected under 35 U.S.C. 103(a) as being unpatentable over Reusens in view of Blanchard.

Regarding claim 21 and 23, Reusens fails to disclose filtering the OFDM signal in the frequency domain to remove undesired signal tones on the received signal in the time domain prior to performing said channel equalization operation. In the same field of endeavor, Blanchard discloses a method for filtering the OFDM signal in order to remove undesired tone by using FFT and filter and IFFT (Fig 1) before forwarding the OFDM signal for further processing.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to apply a filter between the analog to digital and time domain equalizer for filtering the undesired tone as disclosed by Blanchard into a method and of system of Reusens. The motivation would have been to obtain a quality signal.

Regarding claims 25-26, Reusens discloses a demapper for mapping time instant to symbol (Fig 1, DEMAP) and time domain equalizer (Fig TEQ) but failing to disclose the receiver further includes a time domain to frequency domain transform circuit for converting a received signal from the time domain to the frequency domain; a tone filter coupled to the time domain to frequency domain transform circuit for filtering tones, outside a set of tones used by the receiver, from the received signal in the frequency domain; and a frequency domain to time domain transform circuit for coupling the tone filter to the time instant to symbol mapping module. In the same field of endeavor, Blanchard discloses a time domain to frequency domain transform circuit (Fig 1, Ref 16) for converting a received signal from the time domain to the frequency domain; a tone filter (Fig 1, Ref 17, 18 and 20) coupled to the time domain to frequency domain transform circuit for filtering tones, outside a set of tones used by the receiver, from the received signal in the frequency domain; and a frequency domain to time domain transform circuit (Fig 1, Ref 22) for coupling the tone filter for outputting a time domain filter to be used for further processing.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to apply a filter between the analog to digital and time domain equalizer for filtering the undesired tone as disclosed by Blanchard into a method and of system of Reusens. The motivation would have been to obtain a quality signal.

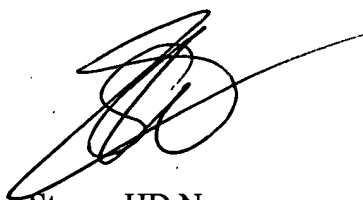
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***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven HD Nguyen whose telephone number is (571) 272-3159. The examiner can normally be reached on 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy D. Vu can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to be 'SHD', with a long horizontal line extending to the right.

Steven HD Nguyen  
Primary Examiner  
Art Unit 2665  
8/30/05